SECURITY AND PRIVACY

Definitions

- What is security?
  - Protection of information and property from theft, corruption, or natural disaster
  - Allowing the information and property to remain accessible and productive to its intended users.
- What is privacy?
  - **The** desire of personal privacy concerning the storing, repurposing, providing to third-parties
  - Displaying of information via the Internet.

Why do we need security?

- To protect money
  - Banks, Financial transactions
- To protect information
  - Government agencies
- To ensure personal safety
  - Airlines, trains, bridges
- To keep the bad guys out
  - Or just the nosy…

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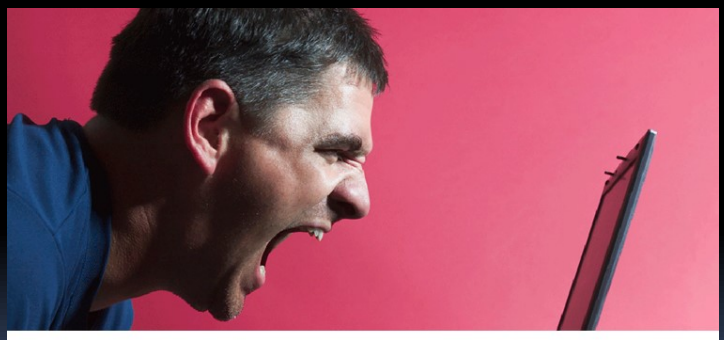
What is the price of security?



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Ease of use

- With more security comes:
  - More checks
    - Is what you are doing is legit ?
  - More chances for error
    - Entering wrong password
  - Differing rules
    - One site wants letters and numbers
    - Another wants a special character
  - More frustration

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Performance

- The more security you have in place
  - The more activities your computer is doing to check things
  - These activities take resources
  - And your computer slows down…
- You are entering more information to authorize
  - And your performance slows down…

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Inability to act

- Sometimes you just can't do what you are entitled to do,
  - Forgotten password
  - System imposed restrictions
    - 3 times enter incorrect password
- Security servers are often different than content servers
  - Differing point of failure

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Who are the bad guys?

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Malware

- Short for malicious software
- Programs designed to
  - Disrupt or deny operation
  - Gather information
  - Gain unauthorized access
- Software is considered malware based on the intent of the programmer

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Virus

- A computer virus attaches itself to a program or file
- Enables it to spread from one computer to another, leaving infections as it travels.
- Viruses can increase their chances of spreading to other computers by infecting files on a network file system or a file system that is accessed by another computer

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Worm

- Similar to a virus by design and is considered to be a sub-class of a virus.
- Worms spread from computer to computer, but unlike a virus, it has the capability to travel without any human action.
- A worm takes advantage of file or information transport features on your system, which is what allows it to travel unaided.

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Trojan Horse

- At first glance will appear to be useful software
  - Do damage once installed or run on your computer.
- Results vary
  - From the merely annoying to causing serious damage
  - Can also create a backdoor on your system
  - Backdoors used to create botnets
- Unlike viruses and worms, Trojans do not reproduce by infecting other files nor do they self-replicate.

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Spyware

- **Collects** small pieces of information about users without their knowledge.
  - Surfing habits
- Can install additional software
  - Keyloggers
- Change web browser activity
  - Home page
- SLOWS DOWN YOUR SYSTEM
  - Additional activity
  - Change computer settings

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DDos

- Use of "Bots" to attack system
- Easiest is to attach bandwidth
  - Also easiest to protect against
- More common is to attack a system resource
  - Such as TCP SYN attack
  - Utilizes existing TCP protocol – 3-way handshake
  - Floods TCP connection table

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Back to security..

How do we achieve security?

- Physical
  - Lock it down
- Authentication
  - Are you who you say you are?
- Authorization
  - Are you allowed to do what you are trying to do?

Physical security

- Armed guards, gates, etc.
  - Not so good
- Possession
  - Adequate for most of us
- Lock and keys, badges
  - Good for large things
  - Computer lab

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Authentication

- Badges, passports
  - Physical possession
- Passwords
  - Differing degrees of difficulty
- Biometrics
  - Fingerprints, retinal scans
- Captcha keys
  - Are you a bot?
- Digital certificates
  - Am I talking to the real site?

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Authorization

- Access control
  - Tying an object to permissions
  - Can be done individually or to a role
  - Can be logical or physical
- Role-based access control
  - Person is assigned "roles"
  - The roles are assigned permissions
  - Much easier to administer

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Privacy

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What is privacy?

- The ability to keeping information from being shared without your approval
  - Personally Identifying Information (PII)
    - Name
    - Social Security number
    - Bank account number
  - Non-PII information
    - Surfing habits
    - Purchasing habits

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What type of info?

- Healthcare records
- Criminal justice investigations and proceedings
- Financial institutions and transactions
- Biological traits, such as genetic material
- Residence and geographic records
- Ethnicity, gender, sexual preference
- Many, many more

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Does privacy exist anymore?

- Unfortunately, the horses have left
  - We can close the barn door, but…
  - We were in such a rush to make the data available, privacy was short-circuited
- A lot of factors are not under your control
  - Other people's data
- Significant number of experts believe that privacy no longer exists

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Why has privacy disappeared?

- On-line shopping, surfing
  - Habits are recorded
- Identifying information
  - IP addresses, PIP
- Public surveillance
  - Cameras, facial recognition software
- Legislation
  - Terrorism, public right to know

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Is it hopeless?

- Small subset of people with access
  - Like to believe those people require authorization
- Keep that subset small
  - Keep your info out of the bad guys hands
    - Guard your personal information
    - Don't be afraid to question someone's right to know
- Information on the net is permanent

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How to fight back…

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Passwords

- Social engineering
  - Have differing degrees of passwords
  - Don't share your important passwords
- Passwords guessers
  - Combine numbers, letters, special characters
  - Use the phrase method
    - Michelle Took Bobby Out For 4 Beers
      - MTBOF4B

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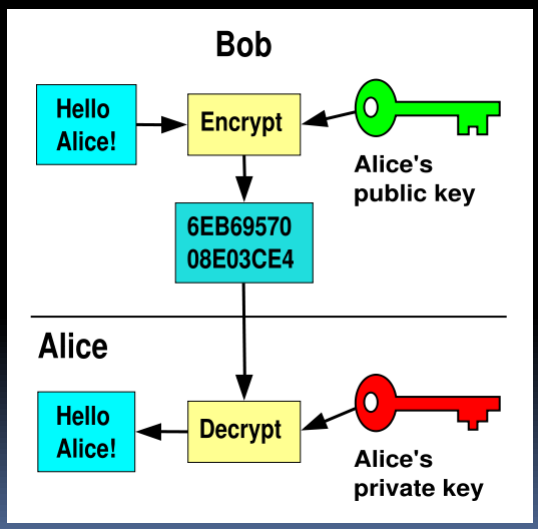
Encryption



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Backups

- Back your systems up regularly
  - Automated software
  - Built into Macs, Windows
- Can backup to portable hard drive
  - Very inexpensive these days
- If a virus attacks you, you can recover
  - Reload from backups

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Personal habits

- Be careful about posting PII
  - Who can see it?
  - What is their privacy policy?
- Use differing levels of e-mail addresses
  - Keep one for shopping, surveys
  - Keep one for professional
  - Keep one for personal

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Personal habits

- Change your passwords regularly
  - Every 90 days or so
  - Do NOT use your birthday…
- Watch your bank accounts
  - Easy to log in and verify transactions
  - Programs like Quicken will download
- Use encryption
  - https://

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Personal habits

- Verify on-line sites
  - Don't give your CC# unnecessarily
  - Ensure it is a legitimate business
- NEVER respond to phishing
  - They will clean out your account in seconds
- Run virus checkers
  - Norton, MacAfee, ClamXav
- Backup your system regularly

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